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ABSTRACT

A study compared the performances of adults who were learning to read with those of two groups of preliterate and second-grade children on selected cognitive tasks and on the display of certain metacognitive understandings. It was hypothesized that if the adults (who could not successfully read a passage from a fourth-grade reader) did as well as the second-grade children (whose reading development was normal for their age group), these adults would then have achieved certain cognitive tasks and metacognitive understandings that researchers believe are conducive to literacy attainment. Subjects, 24 adults, 28 kindergarten students, and 28 second-graders, completed a series of cognitive task assessments. Results showed that the adults scored higher than the kindergarten children on all cognitive task assessments except one, as well as on all three metacognitive assessments. However, they scored lower than the second-grade children on four of the cognitive task assessments. There were no significant differences between the adults' and the second-graders' responses on the metacognitive behaviors test. Results indicated that, although the adults could engage in metacognitive activity that is present only in children who exhibit cognitive clarity about the reading process, these same adults could not accomplish certain reading-related cognitive tasks that a group of second-graders could accomplish. Findings suggest that these nonliterate adults experience cognitive confusion about the reading process that manifests itself as an inability to do certain tasks related to beginning reading. (Tables of data and references are attached.) (NKA)

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COMPARATIVE LITERACY ATTAINMENT BEHAVIORS OF NON-LITERATE ADULTS AND PRELITERATE AND EARLY LITERATE CHILDREN

by

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COMPARATIVE LITERACY ATTAINMENT BEHAVIORS OF NON-LITERATE ADULTS AND PRE-LITERATE AND EARLY LITERATE CHILDREN

Although the number of adults in the United States who lack basic literacy skills has not been definitely established (Kozol, 1985; Chall, 1983), a recent US Department of Education study showed that the number of adult illiterates increases by 2 million each year (Marquand, 1986). Kozol (1985) reported that the federal government spends 100 million dollars a year to address the needs of adult illiterates. Much of this money is spent for adult basic education classes which represent the federal initiative in eradicating illiteracy. However, researchers such as Kavale and Lindsey (1977) have asserted that adults enrolled in such programs rarely ever learn to read. Perhaps one reason that these adults fail to learn to read is that there is still not available necessary information concerning how these adults approach the problem of learning to read (Chall, 1984).

The study reported here explored whether a group of adults who were learning to read had accomplished certain cognitive tasks and achieved certain metacognitive understandings which researchers (Mattingly, 1972; Downing, 1977) have identified as conducive to literacy attainment. The performance of these adults, who could not successfully read orally a passage from a fourth-grade reader, was compared to the performances of a group of preliterate children and of a group of second-grade children on the selected cognitive tasks and on the display of certain metacognitive understandings. It was assumed that if the adults did as well as the second-grade children, whose reading development was normal for their age group, then the adults would have achieved certain cognitive tasks and metacognitive understandings which researchers (Mattingly, 1972; Downing, 1977) have suggested are

conducive to literacy attainment. Specifically, it was hoped that the research would illuminate whether adults who cannot read exhibit cognitive clarity (Downing, 1977) about the reading process. Downing (1977) has said that before a child can learn to read, he must achieve cognitive clarity. This clarity manifests itself in two ways. First, the beginning reader will develop certain functional concepts about the reading process. Second, the reader will develop an understanding of the featural concepts related to the reading process. If students fail to develop cognitive clarity, they will exhibit cognitive confusion about the reading process. Johnston (1985) has suggested that three adult disabled readers whom he studied exhibited cognitive confusion because they failed to form a conceptual basis for their reading behavior.

Thus, the study reported here sought to determine whether this group of adults who were learning to read exhibited cognitive confusion about featural aspects of reading which Mattingly (1972) and Downing (1977) have identified as important. These featural aspects were defined as cognitive tasks and metacognitive understandings.

Subjects

The subjects for the study were twenty-four adults who orally read with less than 95% accuracy a passage of fourth-grade level or below from the MacMillan Readers. The selected cognitive and metacognitive behaviors of these adults were compared to the same cognitive and metacognitive behaviors of twenty-eight kindergarten children and twenty-eight second-grade children. All of these children were enrolled in regular heterogeneous classes and none were receiving special services.

The twenty-four adults were enrolled in basic literacy classes in various locations in northern West Virginia; all were identified by their teachers as adults who lacked basic literacy skills. These adults ranged in age from 19 to 24; the mean age for the group was 28.4 years. Their educational level ranged from 5 years to 12 years; the mean educational level for the adults was 8.8 years. Six of these adults were high school graduates.

Procedures

All subjects in the study were individually tested with a series of cognitive task assessments: (1) SORT (Slosson, 1981); Stein and Glenn's Analysis of Story Structure (Stein and Glenn, 1978); (3) an analysis of spelling development (Gillet and Temple, 1982); (4) a word count inventory for which subjects counted words on a page; (5) a sentence count inventory for which subjects counted sentences on a page; (6) a recognition of complete thought inventory in which subjects indicated whether or not a group of words did or did not constitute a complete thought; (7) a recognition of marks of punctuation inventory in which subjects identified four basic marks of punctuation. The last four inventories were procedures devised by the first author of this report.

All subjects' selected metacognitive understandings were assessed through the subjects' responding to three oral questions: (1) How are you able to count words on a page? (2) How are you able to count sentences on a page? (3) When you are reading and you come across a word which you do not know, how do you figure out that word? All responses to these questions were tape-recorded.

In order to establish inter-rater reliability on the responses to the metacognitive questions, two raters, both with experience teaching elementary school children and non-reading adults, listened to the tapes and scored them, according to established criteria. These same raters also scored all participants' responses to the cognitive task assessments. Differences were resolved so that agreement was reached on any questionable responses.

A one-way computer-assisted analysis of variance (SAS 5.08) was used to determine if there was a significant difference among groups on each cognitive task assessment. Each time a signficant difference at the .05 level was found, a Duncan's Multiple Range Test was performed to determine between which groups the difference lay.

Chi-square analysis was performed on the results of the metacognitive assessments to determine if there were among groups significant differences at the .05 level.

Results and Discussion

It was assumed at the inception of the study that if the adults' scores were not significantly different from the second graders' scores on the cognitive task assessments and the metacognitive assessments, then the adults had probably achieved certain understandings and behaviors which researchers (Mattingly, 1972; Downing, 1977) have suggested are conducive to literacy attainment. The kindergarten children were placed in the study as a standard against which to measure the adults. If the adults appeared to exhibit cognitive behaviors and metacognitive understandings which were no more advanced than those exhibited by the kindergarten children, then this fact might support the theory that nonliterate adults actually

displayed the cognitive confusion which Downing (1977) has described, and, thus, their reading failure could be attributed, at least partially, to this cognitive confusion.

The results were mixed. On all cognitive task assessments except the recognition of complete thought inventory, the adults scored significantly greater at the .05 level than the kindergarten children did. When the adults and the second-grade children were compared on the cognitive task assessments, however, the second-graders' scores were significantly greater on four of the cognitive assessments: the sentence count inventory, SORT, analysis of spelling features, and the recognition of marks of punctuation inventory. On all three metacognitive assessments, the adults scored significantly greater at the .05 level than the kindergarten children did. There were no significant differences between the adults' and the second-grade children's responses to the three questions which were designed to test metacognitive behaviors.

Tables 1 and 2 summarize the statistical data for the cognitive and metacognitive comparisons.

Thus, the data suggests that these nonliterate adults could adequately engage in metacognitive activity which Downing (1977) has suggested that only children who exhibit cognitive clarity about the reading process can engage in.

However, these same adults have not accomplished certain cognitive tasks, relative to reading, that a group of second-graders has accomplished. These adults can explain how to count sentences on a page, but when they are asked to count sentences, they cannot do this as well as the second-graders can. There was no significant difference between the adults' strategies for figuring out new words and the second-graders' strategies for doing this.

However, on the SORT, which is a word recognition test, the second-graders scored significantly greater than the adults did. In the metacognitive assessment for telling how to identify a sentence on a page, the subjects had to mention terminal punctuation to be scored as having an effective strategy. On this assessment the adults were not significantly different from the second-graders. However, when the adults had to identify basic marks of punctuation, they could not do this as well as the second-graders could.

Thus, there is evidence that these nonliterate adults exhibit cognitive confusion about the reading process. This confusion, however, manifests itself as an inability to do certain tasks related to beginning reading, rather than an ability to explain certain concepts related to beginning reading. Research needs to be done to determine why nonreading adults can explain tasks which they cannot perform.

Stanovich's (1986) discussion may shed light on the findings of this study. Stanovich suggests that it is possible that the causal connections between variation in reading achievement and the efficiency of various cognitive processes may change with development. Thus, it may be totally inappropriate to assume that adults who are learning to read employ the same cognitive processes as children who are learning to read. Research should be done to investigate this. Johnston (1985) has suggested that case studies of adults who are learning to read would be useful in understanding the reading behaviors of this group. Certainly detailed case studies would perhaps give clues as to the cognitive processes which these adults use in learning to read. If these adults do employ cognitive processes which are quite different than those which are employed by children who are learning to read, then the methods and materials which literacy instructors use to teach adults should reflect the processes which the adults use.

Table 1

Cognitive Task Assessments

Table 1-A
SORT Scores

Group	Range	Mean	Standard Deviation	Standard Error of Mean
Kindergarten	0-2.4	.3**	.5	.1
Second-Grade	1.9-7.0	3.9*	1.3	.2
Adults	.3-5.8	2.3**	.3	.3

Means with * between are significantly different and means with matching ** are also significantly different at .05 level of significance.

Table 1-B
Elements from Stein and Glenn's Analysis of Story Structure

Group	Range	Mean	Standard Deviation	Standard Error of Mean
Kindergarten	0-7	1.6428*	2.4375	.4606
Second-Grade	0-7	5.8570	2.0496	.3873
Adults	6-7	6.7410	.4879	.1844

Means with * between are significantly different at .05 level of significance.

Table 1-C
Analysis of Spelling Developmental Features

Group	Range	Mean	Standard Deviation	Standard Error of Mean
Kindergarten	0-4.0	1.0379**	.1961	.02437
Second-Grade	3.4-4.9	4.3140*	.4182	.07903
Adults	1.1-4.2	2.7680*	.9437	.19260

Means with * between are significantly different and means with matching ** are also significantly at .05 level of significance.

Table 1-Continued

Table 1-D
Word Count Inventory

Group	Range	Mean	Standard Deviation	Standard Error of Mean
Kindergarten	0-1	.1429*	.3563	.0673
Second-Grade	0-1	.8333	.4179	.0790
Adult	0-1	.7851	.3807	.0777

Mean with * is significantly different from other means at .05 level.

Table 1-E
Sentence Count Inventory

Group	Range	Mean	Standard Deviation	Standard Error of Mean
Kindergarten	0-1	.1428**	.3563	.0673
Second-Grade	0-1	.7500*	.5089	.0833
Adults	0-1	.4583**	.4409	.1038

Means with * between are significantly different and means with matching ** are also significantly at .05 level of significance.

Table 1-F
Recognition of Complete Thought Inventory

Group	Range	Mean	Standard Deviation	Standard Error of Mean
Kindergarten	1-8	3.962	1.72	.331
Second-Grade	3-8	5.178*	1.846	.349
Adults	2-7	4.583	1.348	.094

Means with * between are significantly different at .05 level of significance.

Table 1-G
Recognition of Marks of Punctuation Inventory

Group	Range	Mean	Standard Deviation	Standard Error of Mean
Kindergarten	0-4	1.3928**	1.1968	.2262
Second-Grade	3-4	3.7857*	.4178	.0790
Adults	1-4	3.0833**	1.1000	.2246

Means with * between are significantly different and means with matching ** are also significantly different at .05 level of significance.

Table 2

Metacognitive Assessments

Table 2-A

Strategies For Counting Words on a Page

Group	Effective§ Strategies	Ineffective Strategies	Total
Second	23**	5**	28
Adults	21 *	3	24
Kindergarten	7**	21**	28
Totals	51	29	80

Strategies with * between are significantly different at the .05 level. Strategies with matching ** are signficantly also significantly different at the .05 level.

§A strategy was judged effective if the respondent said he or she could read the word or if the respondent said a word was composed of letters and bound by space.

Table 2-B

Strategies For Counting Sentences on a Page

Group	Effective§ Strategies	Ineffective Strategies	Total
Second	27	1	28
Adults	21	3	24
Kindergarten	6*	22*	28
Totals	54	26	80

Strategies with * are significantly different at the .05 level of significance.

§A strategy was judged as effective if the respondent said a sentence began with a capital letter and had some sort of terminal punctuation.

Table 2-Continued

Table 2-C
Strategies Named For Figuring Out New Words§

Strategy	Groups: Second	Adults **	Kindergarten	Total
1-Graphophonemic	26	21	13	60
2-Semantic	7	4	0	11
3-Syntactic	7	7	0	14
4-Ask someone	12	10	10	32
5-written source	2	4	6	12
6-Guess	0	0	5	5
7-Skip the word	0	4	0	4
8-Use pictures	0	1	2	3
9-Don't know	0	1	3	4
Totals	54	52	39	145

Groups with ** between are significantly different at the .05 level of significance.

§Subjects could name as many strategies as they felt appropriate to the question.

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